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SEQUENCE LISTING

<110> O'HANLEY, PETER
DENICH, KENNETH
SCHMIDT, M. ALEXANDER

<120> IMMUNOGENIC PILI PRESENTING FOREIGN PEPTIDES, THEIR
PRODUCTION AND USE

<130> 050939/0104

<140> 09/833,079

<141> 2001-04-12

<160> 39

<170> PatentIn Ver. 2.1

<210> 1

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 1

Pro Gln Gly Gln Gly Lys Val Thr

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<210> 2

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 2

Ala Lys Phe Gly Gly Met Gly Ala Lys Lys Gly

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<210> 3

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 3

Pro Gln Gly Gln Gly Glu Val Ser Phe

1

5

<210> 4
 <211> 13
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

<400> 4
 Asn Phe Lys Gln Leu Gln Gly Gly Ala Ala Lys Lys Gly
 1 5 10

<210> 5
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

<400> 5
 Pro Gln Gly Gln Gly Lys Val Thr Phe
 1 5

<210> 6
 <211> 13
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

<400> 6
 Asn Phe Lys Lys Ala Ala Gly Gly Gly Gly Ala Lys Thr
 1 5 10

<210> 7
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic peptide

<400> 7
 Gln Gly Ser Gly Gln Val Asn Phe Lys Gly
 1 5 10

<210> 8
 <211> 14
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 8
 Asn Phe Lys Lys Ala Ala Thr Pro Gly Gly Ala Ala Lys Thr
 1 5 10

<210> 9
 <211> 12
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 9
 Ile Pro Gln Gly Gln Gly Lys Val Thr Phe Asn Gly
 1 5 10

<210> 10
 <211> 9
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 10
 Ile Pro Glu Gly Gln Gly Lys Val Thr
 1 5

<210> 11
 <211> 13
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 peptide

<400> 11
 Asn Gly Gly Thr Val His Phe Lys Gly Glu Val Val Asn
 1 5 10

<210> 12
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<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 12
Thr Thr Val Thr Val Asn Gly Gly Thr Val His Phe
1 5 10

<210> 13
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

<400> 13
Pro Gln Gly Gln Gly Glu Val Thr
1 5

<210> 14
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

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Pro Gln Gly Gln Gly Glu Val Ala
1 5

<210> 15
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
peptide

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Thr Thr Val Asn Gly Gly Thr Val His
1 5

<210> 16
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<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 16

Ile Pro Gln Gly Gln Gly Lys Val Thr Phe Asn Gly Thr Val
1 5 10

<210> 17

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 17

Ala Lys Phe Gly Gly Met Gly Ala Lys Lys Gly
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<210> 18

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 18

attaaccctc actaaag

17

<210> 19

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 19

aatacgactc actatag

17

<210> 20

<211> 16

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 20

aacagctatg accatg

16

<210> 21
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 21
atgagactgc gattctctgt 20

<210> 22
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 22
tccgtttctc acaattctga 20

<210> 23
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 23
cctgaaatac gagaatatta 20

<210> 24
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 24
taatattctc gtatttcagg 20

<210> 25
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 25
tggactggta taacaatcga 20

<210> 26
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<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 26
tccgtttcgc acaattctga 20

<210> 27
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 27
agtggattca tgcagcattt ctagaaa 27

<210> 28
<211> 16
<212> DNA
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<220>
<223> Description of Artificial Sequence: Primer

<400> 28
tggacctcct gagcta 16

<210> 29
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 29
ggggcagccc tgccgtccca aat 23

<210> 30
<211> 19
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 30

aaacaccatg aaacacaca

19

<210> 31

<211> 588

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
pHUR849 plasmid

<220>

<221> sig_peptide

<222> (1)..(66)

<220>

<221> mat_peptide

<222> (67)..(585)

<220>

<221> CDS

<222> (1)..(585)

<400> 31

atg	aga	ctg	cga	ttc	tct	gtt	cca	ctt	ttc	ttt	ttt	ggc	tgt	gtg	ttt	48
Met	Arg	Leu	Arg	Phe	Ser	Val	Pro	Leu	Phe	Phe	Phe	Gly	Cys	Val	Phe	
		-20					-15					-10				

gtt	cat	ggg	gtt	ttt	gcc	ggg	ccg	ttt	cct	ccg	ccc	ggc	atg	tcc	ctt	96
Val	His	Gly	Val	Phe	Ala	Gly	Pro	Phe	Pro	Pro	Pro	Gly	Met	Ser	Leu	
	-5				-1	1				5					10	

cct	gaa	tac	tgg	gga	gaa	gag	cac	gta	tgg	tgg	gac	ggc	agg	gct	gct	144
Pro	Glu	Tyr	Trp	Gly	Glu	Glu	His	Val	Trp	Trp	Asp	Gly	Arg	Ala	Ala	
				15					20					25		

ttt	cat	ggg	gag	gtt	gtc	aga	cct	gcc	tgt	act	ctg	gcg	atg	gaa	gac	192
Phe	His	Gly	Glu	Val	Val	Arg	Pro	Ala	Cys	Thr	Leu	Ala	Met	Glu	Asp	
			30					35					40			

gcc	tgg	cag	att	att	gat	atg	ggg	gaa	acc	ccg	gta	cgg	gat	tta	cag	240
Ala	Trp	Gln	Ile	Ile	Asp	Met	Gly	Glu	Thr	Pro	Val	Arg	Asp	Leu	Gln	
		45					50					55				

att	ggg	ttc	tcc	gga	cct	gaa	aga	aaa	ttc	agc	ctc	cgg	ctc	agg	aat	288
Ile	Gly	Phe	Ser	Gly	Pro	Glu	Arg	Lys	Phe	Ser	Leu	Arg	Leu	Arg	Asn	
	60					65					70					

tgt	gaa	ttt	aac	agt	cag	ggg	ggg	aac	ctt	ttc	tct	gat	tcc	cgg	ata	336
Cys	Glu	Phe	Asn	Ser	Gln	Gly	Gly	Asn	Leu	Phe	Ser	Asp	Ser	Arg	Ile	
	75				80					85					90	

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agg gtg act ttc gat ggc gtc cgg ggt gaa acg ccg gat aag ttt aat 384
Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn
          95                      100                      105

tta tcc ggt cag gca aaa ggc att aat ctg cag ata gct gat gtc agg 432
Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Val Arg
          110                      115                      120

gga aat att gcc cgg gca gga aaa gta atg cct gca ata cca ttg acg 480
Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
          125                      130                      135

ggg aat gaa gaa gcg ctg gat tac acc ctc aga att gtg aga aac gga 528
Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
          140                      145                      150

aaa aaa ctt gaa gcc gga aat tat ttt gct gtg ctg gga ttc cgg gtc 576
Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
          155                      160                      165                      170

gat tat gag tga 588
Asp Tyr Glu

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<210> 32
<211> 195
<212> PRT
<213> Artificial Sequence

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<220>
<223> Description of Artificial Sequence: Deduced amino
      acid sequence of synthetic pHUR849 plasmid

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<400> 32
Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Phe Gly Cys Val Phe
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Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu
      -5                      -1    1                      5                      10

Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
      15                      20                      25

Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp
      30                      35                      40

Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln
      45                      50                      55

Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn
      60                      65                      70

Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile
      75                      80                      85                      90

Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn
      95                      100                      105

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Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Val Arg
 110 115 120
 Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
 125 130 135
 Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
 140 145 150
 Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
 155 160 165 170
 Asp Tyr Glu

<210> 33
 <211> 588
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 pDAL201B plasmid

<220>
 <221> sig_peptide
 <222> (1)..(66)

<220>
 <221> mat_peptide
 <222> (67)..(585)

<220>
 <221> CDS
 <222> (1)..(585)

<400> 33
 atg aga ctg cga ttc tct gtt cca ctt ttc ttt ttt tgc tgt gtg ttt 48
 Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Phe Cys Cys Val Phe
 -20 -15 -10
 gtt cat tgt gtt ttt gcc ggt ccg ttt cct ccg ccc ggc atg tcc ctt 96
 Val His Cys Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu
 -5 -1 1 5 10
 cct gaa tac tgg gga gaa gaa cac gta tgg tgg gac ggc agg gct gct 144
 Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
 15 20 25
 ttt cat ggt gag gtt gtc aga cct gcc tgt act ctg gcg atg gaa gac 192
 Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp
 30 35 40
 gcc tgg cag att atc gat atg ggg gaa acc ccg gtt cgg gat tta cag 240
 Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln
 45 50 55

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att ggt ttc tcc gga cct gaa aga aaa ttc agc ctc cgg ctc agg aac 288
Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn
    60                65                70

tgt gaa ttt aac agt cag ggt ggg aac ctt ttc tct gat tcc cgg ata 336
Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile
    75                80                85                90

agg gtg act ttc gat ggc gtc cgg ggt gaa acg ccg gat aag ttt aat 384
Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn
                95                100                105

tta tcc ggt cag gca aaa gga att aat ctg cag ata gct gat gcc agg 432
Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Ala Arg
                110                115                120

gga aat att gcc cgg gca ggg aaa gta atg cct gca ata cca ttg acg 480
Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
                125                130                135

ggt aat gaa gaa gcg ctg gat tac acc ctc aga att gtg cga aac gga 528
Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
    140                145                150

aaa aaa ctt gaa gcc gga aat tat ttt gcc gtg ctg gga ttc cgg gtc 576
Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
    155                160                165                170

gat tat gag tga 588
Asp Tyr Glu

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<210> 34

<211> 195

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Deduced amino
acid sequence of synthetic pDAL201B plasmid

<400> 34

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Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Phe Cys Cys Val Phe
    -20                -15                -10

Val His Cys Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu
    -5                -1    1                5                10

Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
    15                20                25

Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp
    30                35                40

Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln
    45                50                55

```

Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn
60 65 70

Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile
75 80 85 90

Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn
95 100 105

Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Ala Arg
110 115 120

Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
125 130 135

Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
140 145 150

Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
155 160 165 170

Asp Tyr Glu

<210> 35
<211> 588
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
pDAL210B plasmid

<220>
<221> sig_peptide
<222> (1)..(66)

<220>
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<222> (67)..(585)

<220>
<221> CDS
<222> (1)..(585)

<400> 35
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Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Phe Cys Cys Val Phe
-20 -15 -10

gtt cat ggt gtt ttt gcc ggt ccg ttt cct cct ccc ggc atg tcc ctt 96
Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Gly Met Ser Leu
-5 -1 1 5 10

cct gaa tac tgg gga gaa gag cac gta tgg tgg gac ggc agg gct gct 144
Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
15 20 25

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ttt cat ggt gag gtt gtc aga cct gcc tgt act ctg gcg atg gaa gac 192
Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp
          30          35          40

gcc tgg cag att atc gat atg ggg gaa acc ccg gtt cgg gat tta cag 240
Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln
          45          50          55

att ggt ttt tcc gga cct gaa aga aaa ttc agc ctc cgg ctc agg aac 288
Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn
          60          65          70

tgt gaa ttt aac agt cag ggt ggg aac ctt ttc tct gat tcc cgg ata 336
Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile
          75          80          85          90

agg gtg act ttc gat ggc gtc cgg ggt gaa acg ccg gat aag ttt aat 384
Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn
          95          100          105

tta tcc ggt cag gca aaa ggc att aat ctg cag ata gct gat gcc agg 432
Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Ala Arg
          110          115          120

gga aat att gcc cgg gca ggg aaa gta atg cct gca ata cca ttg acg 480
Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
          125          130          135

ggt aat gaa gaa gcg ctg gat tac acc ctc aga att gtg aga aac gga 528
Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
          140          145          150

aaa aaa ctt gaa gcc gga aat tat ttt gcc gtg ctg gga ttc cgg gtc 576
Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
          155          160          165          170

gat tat gag tga 588
Asp Tyr Glu

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<210> 36

<211> 195

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Deduced amino acid sequence of synthetic pDAL210B plasmid

<400> 36

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Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Phe Cys Cys Val Phe
      -20          -15          -10

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```

Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu
      -5          -1    1          5          10

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Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
          15          20          25

```

Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp
 30 35 40
 Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln
 45 50 55
 Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn
 60 65 70
 Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile
 75 80 85 90
 Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn
 95 100 105
 Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Ala Arg
 110 115 120
 Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
 125 130 135
 Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
 140 145 150
 Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
 155 160 165 170
 Asp Tyr Glu

<210> 37
 <211> 588
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 pDAL200A plasmid

<220>
 <221> sig_peptide
 <222> (1)..(66)

<220>
 <221> mat_peptide
 <222> (67)..(585)

<220>
 <221> CDS
 <222> (1)..(585)

<400> 37
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 Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Phe Cys Cys Val Phe
 -20 -15 -10

gtt cat ggt gtt ttt gcc ggt ccg ttt cct ccg ccc ggc atg tcc ctt	96
Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu	
-5 -1 1 5 10	
cct gaa tac tgg gga gaa gaa cac gta tgg tgg gac ggc agg gct gct	144
Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala	
15 20 25	
ttt cat ggt gag gtt gtc aga cct gcc tgt act ctg gcg atg gaa gac	192
Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp	
30 35 40	
gcc tgg cag att atc gat atg ggg gaa acc ccg gtt cgg gat tta cag	240
Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln	
45 50 55	
att ggt ttt tcc gga cct gaa aga aaa ttc agc ctc cgg ctc agg aac	288
Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn	
60 65 70	
tgt gaa ttt aac agt cag ggt ggg aac ctt ttc tct gat tcc cgg ata	336
Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile	
75 80 85 90	
agg gtg act ttc gat ggt gtc cgg ggt gaa acg ccg gat aag ttt aat	384
Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn	
95 100 105	
tta tcc ggt cag gca aaa ggc att aat ctg cag ata gct gat gcc agg	432
Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Ala Arg	
110 115 120	
gga aat att gcc cgg gca ggg aaa gta atg cct gca ata cca ttg acg	480
Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr	
125 130 135	
ggt aat gaa gaa gcg ctg gat tac acc ctc aga att gtg cga aac gga	528
Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly	
140 145 150	
aaa aaa ctt gaa gcc gga aat tat ttt gcc gtg ctg gga ttc cgg gtc	576
Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val	
155 160 165 170	
gat tat gag tga	588
Asp Tyr Glu	

<210> 38

<211> 195

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Deduced amino acid sequence of synthetic pDAL200A plasmid

<400> 38

Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Phe Cys Cys Val Phe
 -20 -15 -10

Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu
 -5 -1 1 5 10

Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
 15 20 25

Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp
 30 35 40

Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln
 45 50 55

Ile Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn
 60 65 70

Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile
 75 80 85 90

Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn
 95 100 105

Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Ala Arg
 110 115 120

Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
 125 130 135

Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
 140 145 150

Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
 155 160 165 170

Asp Tyr Glu

<210> 39

<211> 195

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Comparison
 sequence

<220>

<221> MOD_RES

<222> (13)

<223> Gly or Cys

<220>

<221> MOD_RES

<222> (143)

<223> Val or Ala

<400> 39

Met Arg Leu Arg Phe Ser Val Pro Leu Phe Phe Phe Xaa Cys Val Phe
1 5 10 15

Val His Gly Val Phe Ala Gly Pro Phe Pro Pro Pro Gly Met Ser Leu
20 25 30

Pro Glu Tyr Trp Gly Glu Glu His Val Trp Trp Asp Gly Arg Ala Ala
35 40 45

Phe His Gly Glu Val Val Arg Pro Ala Cys Thr Leu Ala Met Glu Asp
50 55 60

Ala Trp Gln Ile Ile Asp Met Gly Glu Thr Pro Val Arg Asp Leu Gln
65 70 75 80

Asn Gly Phe Ser Gly Pro Glu Arg Lys Phe Ser Leu Arg Leu Arg Asn
85 90 95

Cys Glu Phe Asn Ser Gln Gly Gly Asn Leu Phe Ser Asp Ser Arg Ile
100 105 110

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Arg Val Thr Phe Asp Gly Val Arg Gly Glu Thr Pro Asp Lys Phe Asn
      115                      120                      125

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Leu Ser Gly Gln Ala Lys Gly Ile Asn Leu Gln Ile Ala Asp Xaa Arg
130 135 140

Gly Asn Ile Ala Arg Ala Gly Lys Val Met Pro Ala Ile Pro Leu Thr
145 150 155 160

Gly Asn Glu Glu Ala Leu Asp Tyr Thr Leu Arg Ile Val Arg Asn Gly
165 170 175

Lys Lys Leu Glu Ala Gly Asn Tyr Phe Ala Val Leu Gly Phe Arg Val
180 185 190

Asp Tyr Glu
195